

ON TWO SPECIES OF *LUDIUS* (COLEOPTERA).

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Ludius rufopleuralis n. sp.

Something like forty years ago Dr. John Hamilton, in an article in the *Canadian Entomologist* entitled "Notes on Coleoptera No. 6," in concluding some remarks on *Corymbites nigricornis* Panz. wrote as follows: "From the more southern parts of Canada and from Massachusetts comes a form with a narrow margin and the hind angles of the thorax, the inflexed sides, the prosternal lobe, the epipleura of the elytra, sides of the abdomen and narrow posterior margin of the central segments rufous; the feet varying in color as in the typical forms. Except in color there appears to be no other separate, but this is so striking that it is not obvious, without some study, that the forms are all one thing."

Most of the color characters mentioned by Hamilton affect only the under side, and viewed casually from above this form may easily be confused with either *nigricornis* or *aratus*, with both of which in fact it is mixed in the Le Conte collection.

Quite recently Mr. Frost brought me one of the specimens with red propleura for an expression of opinion. It had been identified for him by Blanchard many years ago as "*nitidulus*" and more recently by Hyslop as "*nigricornis* var. *nitidulus*." I found similar specimens in my *aratus* series, but critically examined they did not look right there and further study instead of leading me to the conclusion that "the forms are all one thing" as Dr. Hamilton puts it, convinces me that this particular form with the red propleura is specifically distinct from both *aratus* and *nigricornis* (*metallicus* Payk.; *nitidulus* Lec.).

The color characters of this species, for which I propose the name *rufopleuralis*, are well stated by Hamilton, though it should be said that the side margin of the thorax and the hind margins of the ventral segments are in some specimens scarcely at all paler, and in addition it may be mentioned that in most examples the front margin of the pronotum is narrowly dull rufous. The sides of the abdomen are usually rather narrowly but sometimes much more broadly reddish.

None of these color characters exist in *nigricornis*, while in *aratus* only the prosternal lobe and the epipleura are distinctly reddish in fully colored examples; the hind angles of the thorax showing occasionally vague indications of a paler tint. Nor is it true as Hamilton intimates that color is the only separate. As

compared with *rufopleuralis*, *aratus* is as a rule slightly larger and more robust and of duller lustre; the pronotal punctuation is perceptibly coarser and closer, especially antero-laterally; the third antennal joint is noticeably longer than the fourth, whereas in *rufopleuralis* the third and fourth joints are equal or very nearly so. In both species the sides of the thorax are rather strongly rounded before the middle, in distinction from *nigricornis*, in which the sides are more oblique in front. *Nigricornis* is also smaller than *rufopleuralis*, the pronotal punctuation still sparser and finer and scarcely at all coarser or closer at sides than at middle, the third and fourth antennal joints are nearly equal in length, as they are in *rufopleuralis*. On the whole *rufopleuralis* appears to me to be closer to *aratus* than to *nigricornis* and its proper position is between these two species.

The 16 examples of *rufopleuralis* studied vary in length from 10.2 to 11.3 mm. They are from Quebec (Montreal and Berthierville), and various points in Maine, New Hampshire and Massachusetts. Of the three examples in the Le Conte collection one is without locality and the other two are labeled Detroit and "Can." The type is from Tyngsboro, Mass., and bears date 7-30-16.

The principal distinguishing characters of the three species above considered are for convenience tabulated below.

KEY.

- Prothorax strongly rounded in front, as wide before the middle as at base of hind angles.
 - Pronotal punctuation a little coarser and denser, especially at sides; propleura entirely dark; 3rd antennal joint evidently longer than the 4th; size generally a little larger, surface less shining *aratus*
 - Pronotal punctuation somewhat finer and at sides notably less dense; propleura entirely rufous; 3rd antennal joint not longer than the 4th; size as a rule a little smaller and surface more shining *rufopleuralis*
- Prothorax not strongly rounded in front, the sides anteriorly more oblique, the width before the middle less than at base of hind angles.
 - Pronotal punctuation finer and sparser than in the above species, not appreciably closer laterally than at middle; propleura aeneo-piceous throughout; 3rd and 4th antennal joints equal in length; size generally smaller ... *nigricornis*

In Dr. Van Dyke's table of *Ludius* in his recent California Academy of Sciences paper (Vol. XX, March, 1932) his charac-

terization of *aratus* does not fit that species but applies in most respects to *rufopleuralis*.

Ludius appressus Rand.

Not long since I received from Mr. C. A. Frost among other things sent for determination a black Elaterid which looked strange to me. It was about 11 mm. in length, broad, depressed, and posteriorly inflated. I judged it to be a *Ludius* but there was nothing among my black *Ludii* anything like it, nor could I find anything in the literature corresponding to it. The specimen bore the label "Wallface Mt., N. Y.; 12-VII-1922; Quirsfeld." I promptly sent Mr. Quirsfeld a letter of inquiry, to which he replied as follows: "I have made a number of attempts to find a name for it but my efforts were never crowned with success. However I have fostered a wild opinion that the thing may be the female of Randall's *appressus*, of which I have only seen male examples." He adds the further information that "Wallface Mt. is located in Essex Co., New York, and is a peak rising from Indian Pass directly opposite Mt. Macintyre. The specimens (three altogether) were taken at an elevation of about 3,500 feet, in dense spruce woods, all resting on ferns in company with *appressus* and species of the subgenus *Eanus*. To the best of my knowledge Howard Notman and I are the only ones who succeeded in making any captures. How many Notman took I cannot say but I do know that his specimens were found under similar circumstances, although in another part of the Adirondacks. I believe they were collected on Mt. Marcy."

Although I had not suspected any such relationship, Mr. Quirsfeld's "wild guess" at once impressed me as possessing elements of sanity, and was favored by the fact that he found at the same place and under similar conditions specimens of typical *appressus*, all of which were males, while his black examples were all females. A comparison of the black female with my specimens of *appressus* shows that they are identical in their structural features, notably so in the strongly flexed tip of the prosternal intercoxal process, a rare character in *Ludius* proper, while the broader more depressed and posteriorly widened form of the black examples is merely a marked instance of a type of sexual divergence exhibited by the females of many species.

In quest of further information I wrote to Mr. Notman. His reply came from Tucson, Arizona, and being away from his collection he was only able to say "I think I have more than one

specimen and that they were taken in the Moss Pond region near the summit of Mt. Marcy."

Mr. Liebeck writes me from Philadelphia that he has been able to find and examine 16 specimens altogether in various collections, that they are all of the typical form and all males so far as he is able to judge. He says: "I searched all through the *Ludius* and boxes of odds and ends in Elateridae at the Academy but there is nothing like the example you submitted."

From Washington Mr. Fisher writes: "I have examined our material of the genus *Ludius* and find that we have 10 examples of the typical form in regard to color and markings of *appressus* Rand. All of these examples were collected by Hubbard and Schwarz, eight at White Fish Point, Lake Superior, and two at Marquette, Michigan. Nine of these examples are males and the other is probably also a male but the abdomen is in such a position that I could not extract the genitalia. I have looked over the collection as you suggested for specimens of the black form which might be erroneously placed under some other species, but did not find a single example."

The Le Conte collection at Cambridge contains only two examples of *appressus*, both of the typical form and both males. The Blanchard, Bowditch and general collections of the museum do not contain a single specimen of either sex. In my own collection are six specimens of typical *appressus* and all are certainly males.

From a consideration of the above facts the astonishing inference may be drawn that all specimens of *Ludius appressus* in collections are males, and that in the nearly one hundred years since Randall described the species the female, if taken at all, has never before been recognized. If any one has the necessary evidence to controvert this rather incredible assumption the writer would be glad to see it published or to be personally so informed. Even if females of the typical form should be found it would still be true that we have in *L. appressus* an instance of sexual dichromatism as remarkable as it was unexpected.

Ludius appressus has always been a comparatively rare species and most of the examples known to me in collections are from very few sources. Randall described the species from Maine in 1838 but I have no knowledge of its having since been found there. There are in my collection two examples taken by the late Mr. Emerton, the spider specialist, on Mt. Mansfield, Vermont. The remainder of my specimens, and according to Mr. Liebeck nearly all those in the Philadelphia collections, were distributed

back in the '90's by Mr. Frank S. Daggett, who once took them in some numbers in "washup" on the shore of Lake Superior at Duluth, Minnesota. As already stated all the specimens in the National Museum collection were taken by Hubbard and Schwarz at White Fish Point and Marquette on the south shore of Lake Superior, and Le Conte's type of *mirificus* (1850) came from Eagle Harbor, an intermediate point on the same south shore. To these records we must now add Quirsfeld's and Notman's captures in the higher parts of the Adirondacks. It would certainly seem that the species should also occur in the White Mts. of New Hampshire but it is not on any available White Mt. list and I know of no one who has taken it there.

(Since writing the above I learn from Mr. Frost that he has a specimen taken on Mt. Washington.)

The Sting of a Tarantula Wasp.—Our largest Hymenoptera are the large Psammocharid wasps of the genus *Pepsis*, commonly known as "Tarantula hawks." As they successfully overpower the so-called Tarantulas (*Eurypelma* and related genera) in the Southwest, one might surmise that their stings would be formidable. The largest Texas species is *Pepsis nephele* which reaches a length of 63 millimeters. A large individual of this species stung me on the tip of the second finger of the left hand as I was removing it from the net (College Station, Texas; June 21, 1932; 5.45 p. m.). The pain was sharp at first, followed by a gradual swelling of the finger. By 7.30 p. m. there was little pain, but the distal portion of the finger had become definitely swollen; by 10.30 p. m. the swelling had extended to the back of the hand; and by the next morning, the entire hand and wrist had become swollen. By afternoon, the swelling had extended up the forearm to within two inches of the elbow and had become by this time rather painful. No measures whatever were taken to relieve the condition, as it was not considered serious. The swelling continued during the next day, and although still painful and throbbing on the third day, it began to go down rapidly and by the fourth day was nearly back to normal, although there was considerable itching. By the fifth day this also had disappeared. I must admit, however, that I am susceptible to insect poisons, and in justice to the insect I might say that probably some of the naturalists who have been in the habit of subjecting themselves experimentally to the effects of venomous insects, would have been little inconvenienced by the experience.—STANLEY W. BROMLEY, Columbus, Ohio.